80-09 Santa Lucia

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

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REPLY TO: 3400 Forest Insect and Disease Management January 25, 1980

SUBJECT: Biological Evaluation, Figueroa Mountain

TO: Forest Supervisor, Los Padres N.F.

On January 3 and 4, David Schultz, entomologist, and Gregg DeNitto, pathologist, of the FIDM staff met with Deloy Esplin, Los Padres N.F. andKKen Slater, Southern California Timber Management Specialist to examine tree mortality in and around Figueroa Mountain.

The stands examined were on the mountaintop and along the access roads to the top. The campground near the top of the mountain was particularly investigated. These stands consisted of Coulter pine, bigcone Douglas-fir, ponderosa pine, and live oak. Digger pine was a major component of the stands on the mountain up to a few hundred feet from the top. Soils were generally shallow and rocky with little stand development except near the top. The sites were of poor quality for tree growth. Stocking was variable with some openings and some dense stands of vegetation. Overall, the sites appeared to be supporting more total vegetation than would be optimum for maintaining a thrifty and vigorous growing stock. Both declining and dead ponderosa and Coulter pines were scattered through the area. Mortality was predominantly in groups, although some individual dead trees were present.

Most of the dead and declining trees had been attacked by either the western pine beetle, Dendroctonus brevicomis, or the red turpentine beetle Dendroctonus valens, in combination with twig beetles, Pityophthorus spp. The turpentine beetle and twig beetles are generally common only in low vigor trees and their widespread occurrence indicates that the entire area is under stress. Weather records, as well as field observations, indicate that the average precipitation on Figueroa Mountain is not much above the minimal precipitation necessary to sustain conifers on a long-term basis. The normal low precipitation is further aggrevated by the amount of vegetation currently present on the mountain. Past periods of above normal precipitation and a long span of fire protection have allowed a proliferation of conifers, oak, brush, grass, and yucca plants. One of the tree groups examined in the campground had a premortality basal area of 180 ft 2/ac. If thinning is not done to reduce the basal area, some of the competing and declining ponderosa and Coulter pines will become infested with turpentine beetles and twig beetles further weakening them.

The western pine beetle has a chemical attractant, or pheromone, that is released after a successful attack is made. The pheromone attracts other western pine beetles to the general area of the tree under attack, but often they land on nearby trees and may kill them if the beetles are numerous enough. The usual result of a mass attack by the western pine beetle is a group kill with no effect on the stocking level, spatial arrangement, vigor, or species composition of the rest of the stand. Thinning individual aggregates to a basal area of 90-120 ft 2/ac (lower levels where brush or grass is present) will give some control over the appearance of the stands and can be expected to maintain or improve residual tree vigor, thereby preventing significant bark beetle-caused tree mortality for a period of a decade or more.

In one mortality group (symptomatic of a root disease center) below the campground a stump was infected by Fomes annosus, a root-rotting fungus. This fungus occurs on conifers throughout California and can cause tree death. This fungus becomes established in freshly cut stumps and grows into the root system where it can subsequently spread to healthy roots via root contacts. In pines the fungus can grow along and kill cambium of the roots and root collar resulting in girdling and death of the tree. Growth of the fungus outward from a stump results in the formation of disease centers with older dead trees in the center and fading trees on the margins. Presence of the disease was not confirmed in other areas.

In addition to mortality, declining trees were present in the stand. These were characterized by flattened or dead tops, thin crowns, and poor needle retention. Dying or dead terminals of various ages were common, especially where trees were present in dense groups. These symptoms are indicative of stressed, low vigor trees that are more prone to insect or disease attack.

Mortality on Figueroa Mountain can be attributed to a complex of causes. In general, the site is supporting vegetation in excess of its carrying capacity. With the decline in precipitation in recent years, the trees have undergone additional stress, increasing their susceptibility to bark beetles and, in some instances, annosus root disease. This has resulted in mortality throughout the stand as a result of the actions of these natural thinning agents.

Several options are available in the management of the stands on Figueroa Mountain.

1) Do nothing- This will result in the stand undergoing additional mortality until the natural processes have reduced the stocking to levels that the site can support. There will be no selection of trees by the manager and it can be expected that group kills will occur. Leaving the dead trees will benefit some cavity-nesting birds, but will increase the hazard to recreationists.

2) Salvage dead trees- Removing dead trees will have no effect on the live basal area or the vigor of the stand. Some bark beetles will be removed from the area, but the effects on future mortality would be minimal. Salvaging would reduce the fire hazard, recreational hazard, and nesting sites for some wildlife. Several entries into stands will be necessary as additional trees die.

3) Salvage dead and declining trees, thin stands - This option gives the manager the most control over the appearance of the area. By removing dead and declining trees, hazards are reduced and fewer entries are necessary. Combining this salvage with a thinning brings the stocking down to acceptable levels and allows the manager to select what trees to retain.

Due to the potential for an increasing number of Fomes annosus disease centers, it is suggested that newly created conifer stumps be treated with borax. This will prevent new infections of stumps and the development of additional disease centers. This treatment requires a pesticide-use request and an environmental analysis report.

If alternative 3 is selected, you may desire to remove some of the oak to help reduce the vegetative growing stock. There is a pathological consideration if this is done. The production of oak stumps increases the probability of infection by Armillaria mellea, the shoestring root rot fungus. This fungus has the capability to grow from oak stumps to surrounding pines of all sizes. When pines are in close proximity to infected oak stumps, there is a greater opportunity that the pines can be infected by the fungus resulting in mortality of the pines. If oaks are harvested, it would be best to select those that are not within groups of pines or close to pines. Alternatively, the oaks may be pruned to reduce their transpiration and competition for moisture. This will have a more limited duration, but will reduce the opportunity for infection by Armillaria.

Our staff is available for any additional problems or questions that may arise.

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